

NO-A107 727

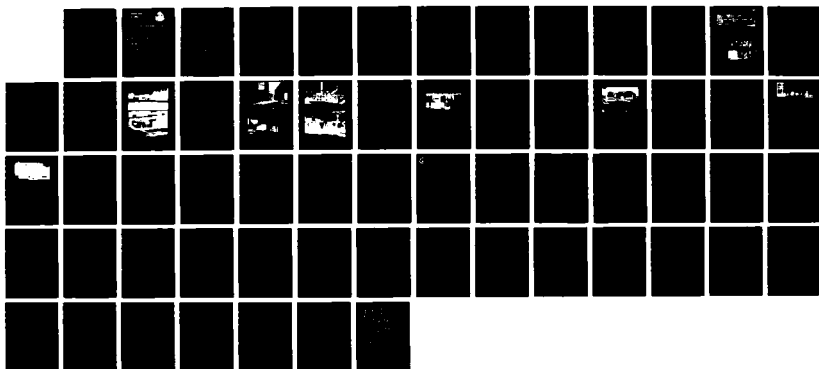
HAZARDOUS WASTE STAFF ASSISTANCE SURVEY POPE AFB NORTH
CAROLINA(U) AIR FORCE OCCUPATIONAL AND ENVIRONMENTAL
HEALTH LAB BROOKS AF.. R A TETLA ET AL. NOV 87
USAF0EHL-87-146EQ0164LHH

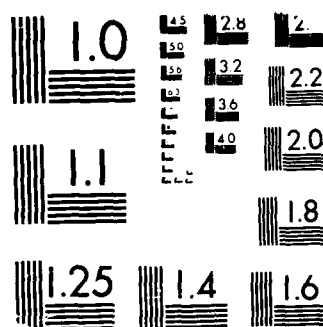
1/1

UNCLASSIFIED

F/G /

NL





MICROCOPY RESOLUTION TEST CHART
 NATIONAL BUREAU OF STANDARDS-1963-A

AD-A187 727

USAF O EHL REPORT

87-146EQ0164LHH



**Hazardous Waste Staff Assistance Survey,
Pope AFB NC**

**ROBERT A. TETLA JR, 1Lt, USAF, BSC
MICHAEL R. SPAKOWICZ, 2Lt, USAF, BSC**

November 1987

Final Report

Distribution is unlimited; approved for public release

**USAF Occupational and Environmental Health Laboratory
Human Systems Division (AFSC)
Brooks Air Force Base, Texas 78235-5501**

NOTICES

When Government drawings, specifications, or other data are used for any purpose other than a definitely related Government procurement operation, the Government thereby incurs no responsibility nor any obligation whatsoever. The fact that the Government may have formulated, or in any way supplied the said drawing, specifications, or other data, is not to be regarded by implication, or otherwise, as in any manner licensing the holder or any other person or corporation; or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

The mention of trade names or commercial products in this publication is for illustration purposes and does not constitute endorsement or recommendation for use by the United States Air Force.

Do not return this copy. Retain or destroy.


Air Force installations may direct requests for copies of this report to: USAF Occupational and Environmental Health Laboratory (USAFOEHL) Library, Brooks AFB TX 78235-5501.

Other Government agencies and their contractors registered with the DTIC should direct requests for copies of this report to: Defense Technical Information Center (DTIC), Cameron Station, Alexandria VA 22314.


Non-Government agencies may purchase copies of this report from: National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield VA 22161

The Public Affairs Office has reviewed this report, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nations.

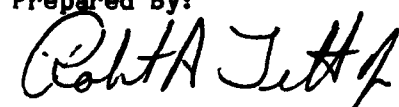
This report has been reviewed and is approved for publication.


JOHN S. COUGHLIN, Colonel, USAF, BSC
Commander

Reviewed By:



ELLIOT K. NG, Maj, USAF, BSC
Chief, Hazardous Waste

Prepared By:


ROBERT A. TETLA JR., 1Lt, USAF, BSC
Hazardous Waste Function


MICHAEL R. SPAKOWICZ, 2Lt, USAF, BSC
Ecology Function


MARTIN L. SWEIGART, 1st Col, USAF, BSC
Chief, Environmental Quality Branch


SHELTON R. BIRCH, Colonel, USAF, BSC
Chief, Consultant Services Division

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
1a. REPORT SECURITY CLASSIFICATION Unclassified			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY N/A			3. DISTRIBUTION/AVAILABILITY OF REPORT		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A			Distribution is unlimited; approved for public release.		
4. PERFORMING ORGANIZATION REPORT NUMBER(S) USAFOEHL 87-146EQ0164LHH			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION USAF Occupational and Environmental Health Laboratory		6b. OFFICE SYMBOL (If applicable) ECQ	7a. NAME OF MONITORING ORGANIZATION		
6c. ADDRESS (City, State, and ZIP Code) Brooks AFB TX 78235-5501		7b. ADDRESS (City, State, and ZIP Code)			
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Same as 6a.		8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8c. ADDRESS (City, State, and ZIP Code) Same as 6c.		10. SOURCE OF FUNDING NUMBERS			
		PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) Hazardous Waste Staff Assistance Survey, Pope AFB NC					
12. PERSONAL AUTHOR(S) 1Lt Robert A. Tetla, USAF, BSC; 2Lt Michael R. Spakowicz, USAF, BSC					
13a. TYPE OF REPORT Final		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Year, Month, Day) November 1987	
				15. PAGE COUNT 56	
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP			
			Pope AFB hazardous waste waste minimization		
			waste reduction		
19. ABSTRACT (Continue on reverse if necessary and identify by block number)					
<p>At the request of HQ MAC/SGPB, the USAFOEHL conducted a hazardous waste staff assistance survey at Pope AFB from 1 Jun 87 to 11 Jun 87. The scope of this survey was to address hazardous waste management practices and explore opportunities for hazardous waste minimization. The survey team performed a shop-by-shop evaluation of chemical waste management practices as well as met with hazardous waste managers and engineers to discuss the hazardous waste program.</p> <p>The results of our survey showed that the hazardous waste program at PAFB is small and works fairly well. With some refinements, the base has an opportunity to have an excellent program. Environmental Coordinator (DEEV), has the responsibility of training shop personnel, inspecting accumulation sites, reviewing finalized manifests and maintaining records. DEEV is not involved with the specific day-to-day logistical details of the waste disposal. The program is primarily managed by the Defense Reutilization. (Continued)</p>					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input checked="" type="checkbox"/> NOTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL 1Lt Robert A. Tetla, Jr.			22b. TELEPHONE (Include Area Code) (512) 536-3305		22c. OFFICE SYMBOL ECQ

Item #19 Cont'd

Management Office (DRMO), the Bioenvironmental Engineering Shop (BEE), and the shop generating the wastes.

Recommendations: (1) The Bioenvironmental Engineer and the Environmental Coordinator should update their waste analysis plan to ensure that the classification of each wastestream is supported by good documentation. (2) The training and education program initiated by the Environmental Coordinator should be continued and expanded. (3) Action should be taken to secure, curb and cover waste storage sites. (4) A program should be initiated to determine the integrity of underground storage tanks. (5) The Engine Shop should acquire metal or plastic pans to catch oil dripping from engines in order to reduce the amount of absorbent padding the shop is currently using. (6) Solvent, oil and fuel waste minimization could prove cost-effective.

ACKNOWLEDGMENT

The authors wish to thank the personnel at Pope AFB who provided information and logistic support during our visit. Mr Lopez, 317 ABG/DEEV, and personnel of the Bioenvironmental Engineering Shop, USAF Hospital Pope/SGPB, were especially supportive of the mission both during and after the field survey.

CONTENTS

	Page
DD Form 1437	i
Acknowledgment	iii
Illustrations	v
I. INTRODUCTION	1
II. BACKGROUND	1
III. PROCEDURE	3
IV. DESCRIPTION OF INDUSTRIAL ACTIVITIES AND WASTE DISPOSAL PRACTICES	6
V. SUMMARY OF GENERAL WASTE DISPOSAL PRACTICES	16
VI. OBSERVATIONS AND CONCLUSIONS	17
VII. RECOMMENDATIONS	20
References	24
APPENDIX	
A Request Letter	25
B Waste Disposal Practices By Shop	29
C Waste Disposal Form	39
D Summary of Annual Forecasted Wastes Generated	45
Distribution List	53

ILLUSTRATIONS

Table		Page
1	Color Coding of Waste Drums	2
2	Categories of Wastes at Pope AFB	5
3	Example of Waste Analysis Plan	22

Figure		
1	DD Form 1348-1	2
2	DRMO Accumulation Site at Fort Bragg	4
3	Pope AFB's Hazardous Material Holding Facility	8
4	Soil Contamination at the Wheel and Tire Shop	10
5	Wheel and Tire Shop Accumulation Site	10
6	Engine Shop Accumulation Site	11
7	Corrosion Control Accumulation Site	13
8	NDI Penetrant Inspection Process	14
9	Soap Dispensers at the Aircraft Washrack	16
10	Refueling Maintenance Accumulation Site	19
11	General Purpose Vehicle Oil Collection System	20

I. INTRODUCTION

In a 27 March 1987 letter (Appendix A), USAF Clinic Pope/SGPB and Environmental Planning, 317 CSG/DEEV, requested the USAF Occupational and Environmental Health Laboratory, Consultant Services Division, Environmental Quality Branch (USAFOEHL/ECQ) to conduct a hazardous waste staff assistance survey at Pope Air Force Base (PAFB). The scope of this survey was to address hazardous waste management practices and to explore opportunities for hazardous waste minimization.

The survey was conducted by Major Elliot K. Ng, 1Lt Robert A. Tetla and 2Lt Michael R. Spakowicz of USAFOEHL/ECQ from 1 June to 11 June 1987.

II. BACKGROUND

A. Base Description

Pope Air Force Base is located in Cumberland County, North Carolina, 12 miles northwest of Fayetteville, North Carolina. The base is the home of the 317th Tactical Airlift Wing, the 1943rd Communications Squadron and the 53rd Mobile Aerial Port Squadron. The base adjoins Fort Bragg and provides airlift support for the airborne forces stationed at Fort Bragg.

B. Hazardous Waste Program

The Hazardous Waste Program at Pope AFB is small and works fairly well. The Environmental Coordinator (DEEV) is responsible for training shop personnel, inspecting accumulation sites, preparing manifests, reviewing finalized manifests and maintaining records. DEEV is not involved with the specific day-to-day logistical details of waste disposal as it is primarily the responsibility of the Defense Reutilization Management Office (DRMO) at Fort Bragg, and the shops generating the wastes. However, DEEV has a good working relationship with DRMO, and the Army Environmental Engineering Office (in Civil Engineering) at Fort Bragg.

When a shop generates a hazardous waste (other than a recoverable petroleum product), it is taken to the nearest accumulation site and placed in the proper container (see Appendix B for a shop-by-shop listing of waste disposal practices). Each accumulation site has a manager responsible for assuring that the containers are properly marked, labeled and color coded. The color coding (see Table 1) of the container denotes its contents (e.g., flammable fuels and oils, nonflammable engine oils). When a container of a known waste is full, the accumulation site manager fills out a DD Form 1348-1 (Figure 1), and contacts the environmental coordinator who prepares a United States Environmental Protection Agency (USEPA) uniform manifest for the waste.

For unknown wastes the Bioenvironmental Engineering (BEE) shop is contacted by the shop to sample the waste. The sample is sent to USAFOEHL Analytical Services Division, USAFOEHL/SA, for analysis. When the results are received by the BEE shop, both the environmental coordinator and the shop requesting the sampling information are informed. Afterwards, the accumulation site manager fills out the DD Form 1348-1 and the environmental coordinator fills out the USEPA uniform manifest.

Table 1. Color Coding of Waste Drums

Waste Category Number	Material	Drum Color	Band Color	Card Color
1	Flammable Fuels, Oils, and Nonhalogenated Solvents	Red	Yellow	Red
2	Nonflammable Contaminated Oils	Black	Yellow	Yellow
3	Nonflammable Engine Oils	White	Yellow	White
4	Nonflammable Synthetic Oils	Green	Yellow	Green
5	Mixed Liquids, Halogenated Solvents	Blue	Yellow	Blue
6	Solid/Overpack Waste	Buff	Yellow	Buff

[illegible]

Figure 1. DD Form 1348-1

Once all the forms are completed (DD Form 1348-1, the USEPA manifest), DRMO is contacted by the accumulation site manager. Personnel from the shop generating the waste transport the waste to Fort Bragg for storage in the DRMO accumulation site (Figure 2). A hazardous waste transportation permit is not required because the route is entirely on government property. The manifest is given to the appropriate DRMO officer who then contacts a contractor to pick up the waste for disposal. Once the waste is treated and disposed of properly, a finalized copy of the manifest is sent back to the environmental coordinator for his records.

If the waste is a recoverable petroleum product (i.e., waste JP-4, waste oils, waste fluids, etc.), it is taken to the hazardous material holding facility (Bldg 41115) on Pope AFB. This waste is picked up by Fort Bragg's civil engineering (CE) personnel and burned as fuel at Fort Bragg's heating plant. In addition, Fort Bragg's personnel pump out 21 oil/water separators on Pope AFB. Fort Bragg's CE is in the process of getting a contractor to assume the job of pumping out the oil/water separators and waste oil storage tanks on Pope AFB. As a requirement of the contract, oil from each pick-up site will be tested for chlorinated hydrocarbons.

III. PROCEDURE

First the Bioenvironmental Engineer's Shop folders were reviewed to determine which shops generate chemical wastes. This was followed by visits to shops to: observe their industrial operations, discuss chemical waste disposal practices with shop personnel, and hand out waste disposal survey forms (see Appendix C). These forms were later picked up during the survey and the information was used for subsequent discussions with shop personnel. The following individuals were also contacted to discuss their respective areas of responsibility in the hazardous waste program:

2Lt Paul Devane, Chief, Bioenvironmental Engineering, SGPB, AUTOVON
486-4122

Mr Robert Lopez, Environmental Coordinator, DEEV at Pope AFB, AUTOVON
486-4193

Mr Garland Evens, Environmental Coordinator, DEEV at Fort Bragg,
AUTOVON 236-3375

Mr William Cain, Chief, DRMO at Fort Bragg, AUTOVON 396-5222

Based on information from the completed survey forms, twelve categories of waste generated (see Table 2) by Pope AFB were established. From Table 2, Column 4 (see Appendix D for calculations), the majority of the wastes, 72.79%, are comprised of waste oils, waste jet fuels, waste PD-680 from degreasing and waste fluids (categories 2,3,4 and 8, respectively). These are referred to in the Pope AFB Hazardous Waste Management Plan¹ as recoverable petroleum wastes and are burned at the Fort Bragg heating plant in their energy recovery program.

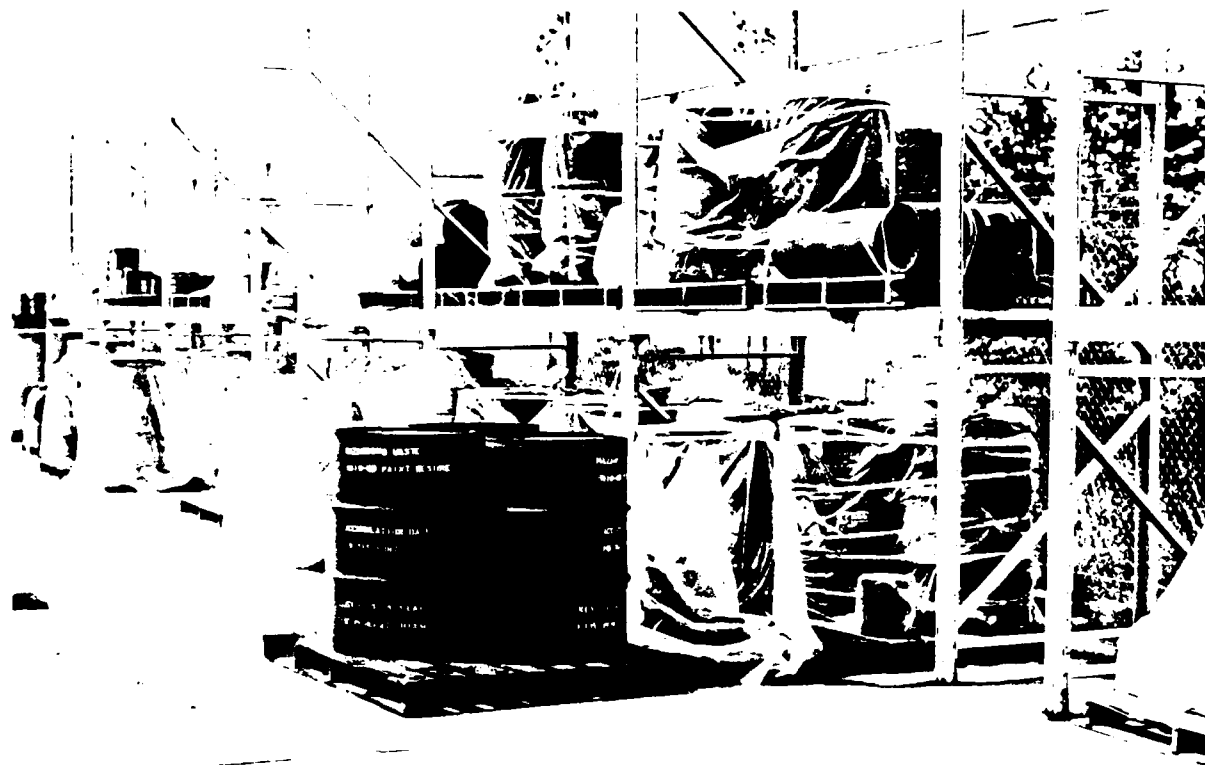


Figure 2. DRMO Accumulation Site At Fort Bragg

TABLE 2. CATEGORIES OF WASTE AT POPE AFB (PAFB)

CATEGORY	PRODUCT	TOTAL (gal/yr)	% TOTAL CATEGORIES	% TOTAL CATEGORIES
1	Spent Lithium ¹ Batteries	1250 ²	----	----
2	Waste Oil	8341	30.06	----
3	Used Jet Fuels	7584	27.33	----
4	Waste Fluids	3224	11.62	----
5	PD-680 used for washing equipment	2212	7.97	29.29
6	Paint Waste and Thinners	2180	7.86	28.87
7	Solvents other than PD-680	1246	4.49	16.50
8	PD-680 used for degreasing parts	1050	3.78	----
9	Stripping Waste	990	3.57	13.11
10	Waste NDI Chemicals	420	1.51	5.56
11	Neutralized Battery Acid	396	1.43	5.24
12	Automotive Fuel	<u>108</u>	<u>0.38</u>	<u>1.43</u>
TOTALS:		27751	100.00	100.00

¹Not included in columns 4 and 5 since it is in batteries/yr and not gallons/yr.

²batteries/yr.

After deletion of recoverable petroleum wastes (waste oil, waste jet fuels, waste PD-680, and waste fluids) burned at the Fort Bragg heating plant, the relative quantities of the remaining wastes were recalculated. Over 87% of the remaining wastes are waste degreasers (both PD-680 used to wash equipment and other solvents), paint waste and thinners, and stripping waste, (i.e., categories 5, 6, 7 and 9).

IV. DESCRIPTION OF INDUSTRIAL ACTIVITIES AND WASTE DISPOSAL PRACTICES

This section documents our findings while visiting the industrial activities.

317 Refueling Maintenance	Building: 150
Shop Supervisor: TSgt Kachiros	AUTOVON: 486-4794

Personnel of the 317th Refueling Maintenance Shop maintain aircraft fuel trucks. All wastes from this shop including alkaline soap, PD-680, motor oil, transmission fluid and jet fuel are dumped down the floor drain that leads to an oil/water separator. The oil/water separator is pumped out by personnel from Fort Bragg about once a month.

317th Fire Truck Maintenance	Building: 250
Shop Supervisor: Mr Butler	AUTOVON: 486-2328

The 317th Fire Truck Maintenance Shop personnel maintain all of the fire fighting and rescue equipment on base. Used motor oil, transmission fluid, hydraulic fluid and fuel are dumped into a 55-gallon drum. When the drum is full it is taken over to Building 454 (Transportation Complex) and emptied into a 230-gallon underground storage tank. The small amount of used brake fluid and antifreeze generated each month is poured down a floor drain leading to an oil/water separator. Aircraft soap is used for cleaning the trucks exhaust tracks (PD-680 had been used before) and is rinsed down the floor drain.

Auto Hobby Shop	Building: 390
Shop Supervisor: Mr Parish	AUTOVON: 486-2293

Personnel from the Auto Hobby Shop help patrons repair their privately owned vehicles. Used motor oil, transmission fluid and degreasers are stored in a 200-gallon underground tank (cleaned out semiannually). The tank is pumped out by personnel from Fort Bragg once a month. This shop uses a degreaser made by Valvoline. PD-680 is not used in this shop.

TRANS Allied Trades	Building: 454
Shop Supervisor: SSgt Proctor	AUTOVON: 486-4418

TRANS Allied Trades personnel repair vehicles. They are also responsible for corrosion control for the entire vehicle fleet. Paint wastes and waste thinners are stored in a 55-gallon drum at the accumulation site near Building 454 and are disposed of as hazardous waste when the drum is full. Shop personnel are responsible for the accumulation site near Building 454.

The next three shops are in Building 454. The description of the waste disposal practices for the 317th Special Vehicle Maintenance Shop applies to all three shops.

317th Special Vehicle Maintenance
Shop Supervisor: MSgt Pope

Building: 454
AUTOVON: 486-4418

Personnel of the 317 Special Vehicle Maintenance Shop are responsible for making major and minor repairs on special purpose vehicles. Used motor oil, transmission fluid, brake fluid and hydraulic fluid are dumped into a sink that drains into a 230-gallon underground storage tank. Personnel from Fort Bragg pump out the tank when necessary (approximately every quarter). Antifreeze is only added to cooling systems so there is no waste antifreeze. Spills are soaked up with Speedy Dry. Speedy Dry is reused until saturation before disposing in the trash. Aircraft cleaning soap is used to wash the floor. There are three Safety Kleen degreasing units in this building for small parts (large parts are contracted out). These units are serviced once a month by the Safety Kleen Corporation.

317 TAW TRANS Vehicle Maintenance
Supervisor: MSgt Holmes

Building: 454
AUTOVON: 486-4418

The 317 TRANS Vehicle Maintenance personnel repair brakes and clutches, perform tune-ups, and repair or replace engines and transmissions.

Intermediate Maintenance
Shop Supervisor: SSgt Schraeder

Building: 454
AUTOVON: 486-4418

Intermediate Maintenance Shop personnel change oil and filters in government vehicles. Battery acid from waste batteries (about 25 per month) is neutralized with baking soda before discharging to the drain.

317 CES Entomolgy
Shop Supervisor: TSgt Durall

Building: 625
AUTOVON: 486-2598

Entomology Shop personnel apply pesticides wherever needed on base. Except for two quarts of motor oil per month used in the spraying equipment and one gallon of soap per month used to clean equipment, no waste is generated by this shop. Unused pesticides are remixed and applied.

Power Production
Shop Supervisor: MSgt Goodman

Building: 625
AUTOVON: 486-2255

Personnel in the Power Production Shop are responsible for servicing all of the generators that provide emergency backup power for the base. Used motor oil, antifreeze and contaminated automotive fuel are placed in 55-gallon drums and taken to the hazardous material holding facility, Bldg 41115, (Figure 3). Used batteries are turned over to the 317th Transportation Battery Shop for neutralization.

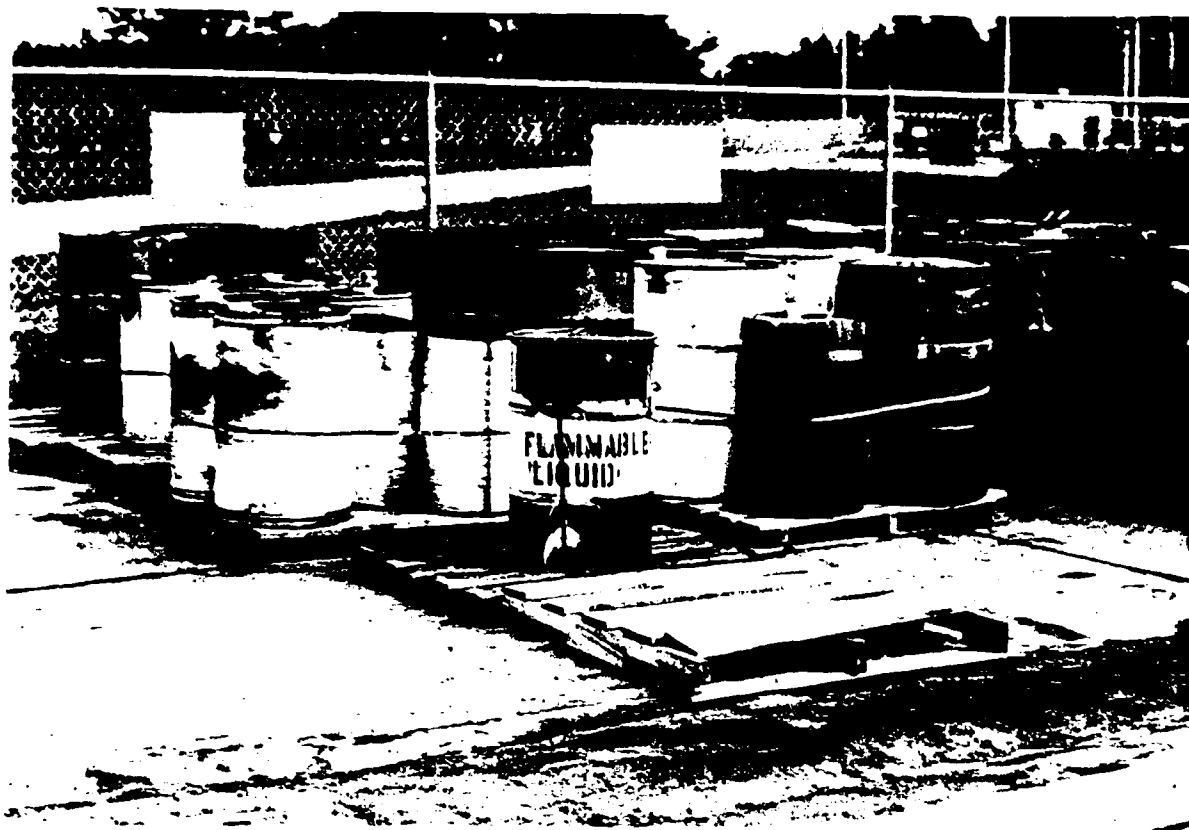


Figure 3. Pope AFB Hazardous Material Holding Facility

317 OMS Repair and Reclamation
Shop Supervisor: MSgt Thornton

Building: 712
AUTOVON: 486-4291

Personnel in the Repair and Reclamation Shop do heavy maintenance work on the C-130 aircraft. A small amount of hydraulic fluid (about one pint per month) is the only waste generated by this shop. The fluid is dumped into the hydraulic fluid bowser at the AGE shop.

Wheel and Tire Shop
Shop Supervisor: SSgt Rose

Building: 712
AUTOVON: 486-4291

Wheel and Tire Shop personnel maintain wheel and tire assemblies of the C-130 and C-141 aircraft. This involves, among other things, cleaning and paint stripping. The wheels are first dipped in a 165-gallon vat of Citrikleen (a degreaser) diluted 3:1, and then in a 165-gallon vat of 100% paint stripper. The wheels are set down on the floor after each dip and rinsed off with water. The rinsewater goes down the floor drain into the sewer system and occasionally leaks out under the door. (There is evidence of soil discoloration, Figure 4.) The rinsewater does not pass through an oil/water separator. Used Citrikleen and paint stripper from the two vats are drummed and stored at the accumulation site (Figure 5) outside Building 712.

This shop also has two PD-680 vats (45-gallon and 10-gallon). These vats are used to clean bearings. The PD-680 is drained from the vats every six months, drummed and stored at the accumulation site outside the building.

GTC
Shop Supervisor: MSgt Ratlaff

Building: 715
AUTOVON: 486-4268

GTC Shop personnel overhaul all gas turbine components (GTC) and gearboxes. Parts are cleaned with a brush dipped in PD-680. This operation is performed over the floor drain in the cleaning room. Rinsewater enters the floor drain and passes through an oil/water separator before entering the sewer system. Used motor oil and hydraulic fluid are placed in bowers kept at the accumulation site next to Building 715 (Figure 6).

JEIM
Shop Supervisor: TSgt Jackson

Building: 715
AUTOVON: 486-4286

The Jet Engine Internal Maintenance (JEIM) Shop personnel overhaul C-130 turboprop engines. Used motor oil, hydraulic fluid and contaminated jet fuel are placed in separate bowers at the accumulation site next to Building 715. All wastes placed in bowers are recorded in a logbook. When full, the bowers are taken to the hazardous material holding facility (Bldg 41115). Absorbent pads are used to catch leaking oil and hydraulic fluid. These pads are placed in a 55-gallon drum and taken daily to a dumpster near the Fire Department Training Pit where they are burned.



Figure 4. Soil Contamination at the Wheel and Tire Shop



Figure 5. Wheel and Tire Shop Accumulation Shop

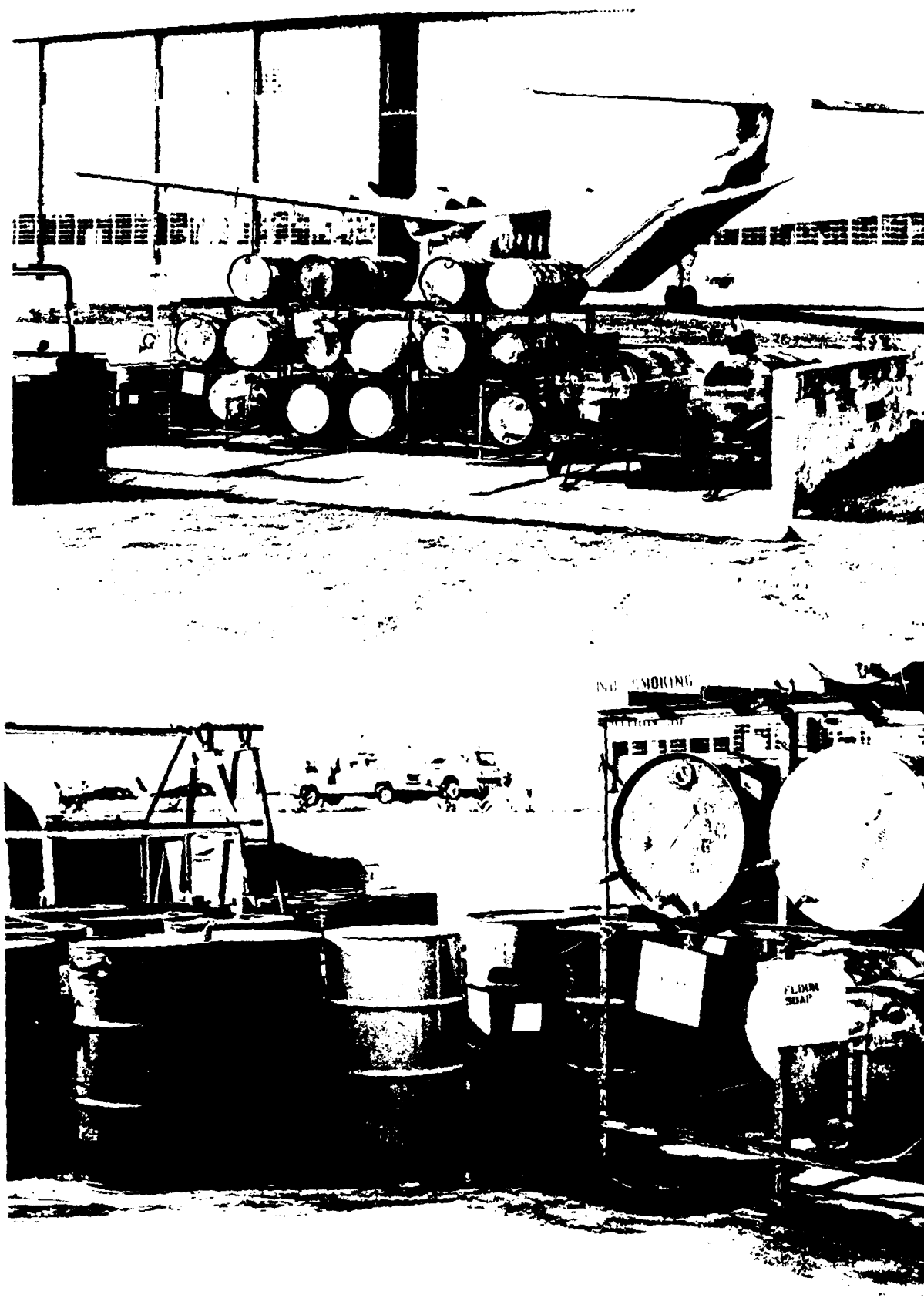


Figure 6. Engine Shop Accumulation Site

KITS
Shop Supervisor: SSgt Watkins

Building: 715
AUTOVON: 486-2888

KITS personnel clean and overhaul the housing for the C-130 turboprop engines. PD-680 and carbon remover are used in this shop. Used carbon remover is placed in a bowser at the accumulation site (Bldg 715). PD-680 is mixed with water and is used for spray cleaning the parts at a washrack. PD-680, used by this shop eventually goes down a floor drain.

Prop Shop
Shop Supervisor: TSgt Brisht

Building: 715
AUTOVON: 486-2888

Personnel in the Prop Shop overhaul C-130 propellers. Hydraulic fluid is the only waste this shop generates. The used hydraulic fluid is placed in a bowser at the accumulation site next to Building 715.

317 Phase
Shop Supervisor: MSgt Lambert

Building: 722 and 724
AUTOVON: 486-4178

Phase Dock personnel inspect and do routine maintenance on C-130 aircraft engines, such as changing the oil. Used motor oil, hydraulic fluid and JP-4 fuel are put into separate bowzers. Absorbent pads are laid on the bottom of drip pans used to change oil. Used absorbent pads (about one roll per week) are taken to the fire training pit and burned.

317 AGE
Shop Supervisor: MSgt Hager

Building: 723
AUTOVON: 486-4176

AGE Shop personnel inspect and maintain the aerospace ground equipment. Used motor oil is kept in a bowser. When the bowser is full, it is taken to the CE accumulation site. Waste hydraulic fluid and PD-680 are stored in 55-gallon drums. When full, these drums are taken to the CE accumulation site. Automotive fuel drained during maintenance is returned to the fuel tanks of the equipment. Waste jet fuel is taken to the fire training pit. The antifreeze in the equipment is changed once a year and used anti-freeze is poured down the drain.

The shop does some touchup painting. It uses both lacquer and polyurethane paints. Only a small amount of polyurethane paint is mixed at a time and all of it is used. Empty spray paint cans are thrown in the trash.

317th FMS Corrosion Control
Shop Supervisor: TSgt Alston

Building: 731
AUTOVON: 486-2148

Corrosion Control Shop personnel are responsible for painting C-130 aircraft and aerospace ground equipment. The types of waste generated in this shop are polyurethane paint wastes, paint thinners, paint strippers and methyl ethyl ketone (MEK). Polyurethane paint wastes are allowed to harden overnight, drummed and disposed of as hazardous waste. Waste paint thinners and methyl ethyl ketone, used to clean spray guns, are drummed and disposed of as hazardous waste.

Paint is removed from small items with rags dipped in B&B 4411 paint remover over a drip pan. The rags and unused stripper are put in a drum and

disposed of as hazardous wastes. Parts are painted in a waterfall type paint booth that is connected to an oil/water separator. The booth is drained once a week and any paint sludge from the booth is bagged and drummed as hazardous waste. The Corrosion Control Shop is responsible for the accumulation site (Figure 7) next to Building 731.



Figure 7. Corrosion Control Accumulation Site

317h AMS Electric Shop
Shop Supervisor: SMSgt Horsley

Building: 731
AUTOVON: 486-2100

Personnel in the Electric Shop service and repair all of the lead acid and Nicad batteries used on base except for batteries used by the motor pool. Spent solution from the lead acid batteries (about 10-15/month) is neutralized with sodium bicarbonate and poured down the drain. The neutralized solution is not tested for heavy metals. The spent solution from the Nicad batteries is neutralized with vinegar or boric acid and poured down the drain. DRMO at Fort Bragg picks up the waste batteries.

317 FMS Nondestructive Inspection (NDI)
Shop Supervisor: MSgt Lankster

Building: 731
AUTOVON: 486-2659

NDI shop personnel check airframes and other aircraft components for cracks using various nondestructive inspection methods including the use of fluorescent dye penetrant, magnetic particle and radiographic methods. Fluorescent penetrant (6635PEP-97A) and penetrant emulsifier (6635PE-57), used in the fluorescent dye penetrant method (see Figure 8), and Magnaglo Carrier II (6635OP-1-2122-40), used in the magnetic particle method, are drummed and disposed of as hazardous waste by the Corrosion Control Shop. Fixer and developer are used in the shop's photography laboratory. The fixer is given to DRMO for silver recovery. The developer is discharged down the drain.

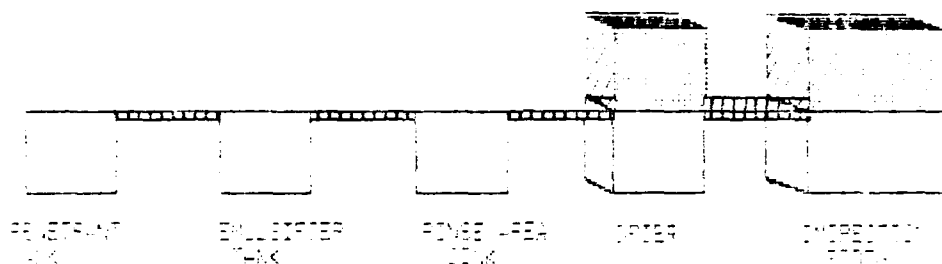


Figure 8. NDI Penetrant Inspection Process

317th FMS Pneudraulics
Shop Supervisor: MSgt Collier

Building: 731
AUTOVON: 486-2621

Personnel in the Pneudraulic Shop overhaul the brake systems of the C-130, C-141 and C-5 aircraft. Parts are cleaned in a 200-gallon tank filled with about 110 gallons of PD-680. The PD-680 is replaced every four to six months and the used PD-680 is transported to the accumulation site used by the Wheel and Tire Shop for disposal. Spray cans containing 1,1,1-Trichloroethane are used. The empty cans are thrown in the trash. Hydraulic fluid is used by the shop, but no waste hydraulic fluid is generated since the fluid is only added to the brake systems as needed.

Aircraft Refurbishing
Supervisor: TSgt Marsala

Building: 732
AUTOVON: 486-4406

Aircraft Refurbishing personnel clean and paint aircraft to prevent corrosion. A lacquer paint is used to paint the inside of the aircraft and any remaining lacquer paint is stored in a can for reuse. A polyurethane type paint is used to paint the exterior of the aircraft. Polyurethane paint waste generated during this process as well as used thinners and solvents are turned over to the Corrosion Control Shop for storage in 55-gallon drums at their accumulation site. Methyl ethyl ketone is used to clean painting equipment.

Fuel Systems Repair
Shop Supervisor: MSgt Harkless

Building: 734 and 736
AUTOVON: 486-4496

Personnel in the Fuel Systems Repair Shop repair fuel systems on the C-130 aircraft. A small amount of compressor oil (1 quart) is placed in a bowser each month. When the bowser is full it is taken to the hazardous material holding facility (Bldg 41115). Contaminated jet fuel is placed in another bowser and also taken to the hazardous material holding facility. Methyl ethyl ketone, purging fluid (6850-00-965-2356) and aircraft soap (6850-00-933-0995) used by this shop are used up in process.

317 FMS AGE Pickup and Delivery
Shop Supervisor: TSgt Price

Building: 759
AUTOVON: 486-2194

AGE Pickup and Delivery personnel perform minor maintenance on aerospace ground equipment after it has been used on the flight line. This entails filling up fuel tanks, checking the oil and washing off equipment. Used motor oil and hydraulic fluid are placed in bowers that are driven onto the flight line when a plane is being serviced. The bowers are parked near Building 759 when they are not on the flight line. When full, they are taken to the CE accumulation site. JP-4 is also collected in a bowser and taken to the fire training pit. The equipment is washed off at a washrack and the rinsewater drains into an oil/water separator that is connected to the sewer.

317 OMS Washrack
Shop Supervisor: Sgt Mead

Building: 764
AUTOVON: 486-4292

Personnel at the OMS Washrack are responsible for cleaning the interiors and the exteriors of the C-130 aircraft. The shop washes one plane per day, five days per week. PD-680 is not used but two concentrations of an aircraft soap (NSN 6850-011921776) are used on the washrack (Figure 9); one concentration is a 1:1 dilution while the other concentration is a 4-16:1 dilution. The soap and rinsewater goes down a drain that is connected to an oil/water separator.

3 MAPS Vehicle Maintenance
Shop Supervisor: TSgt Johnson

Building: 766
AUTOVON: 486-2717

MAPS Vehicle Maintenance personnel repair and service vehicles such as the ACFT loaders and the forklift trucks. Used motor oil, transmission fluid, brake fluid and hydraulic fluid are stored in bowers. When the bowers are full they are taken to the hazardous material holding facility (Bldg 41115). Used batteries are turned over to the 317th Transportation Battery Shop for neutralization. Soap (6850-01-184-3182) and a dry cleaning solvent (NSN 6850-00-274-5421) are used to clean vehicles on the washrack. An oil/water separator is connected to the washrack drain.

Engine Test Cell
Shop Supervisor: MSgt Parks

Building: 792
AUTOVON: 486-4688

Test Cell personnel test T56-A-7B General Motors turboprop engines to make sure they are operating within specifications. Motor oil and hydraulic fluid are the only wastes generated by this shop. These wastes are stored in separate bowers and are taken to the CE accumulation site when the bowers are full. Small amounts of fuel, motor oil and hydraulic fluid leak out of the engines during testing and these fluids are rinsed off the ramp because they pose a safety hazard. All of the drainage from the ramp goes into an oil/water separator. Currently the oil/water separator overflows whenever it rains, but CE is aware of the problem and is working on repairing the separator.

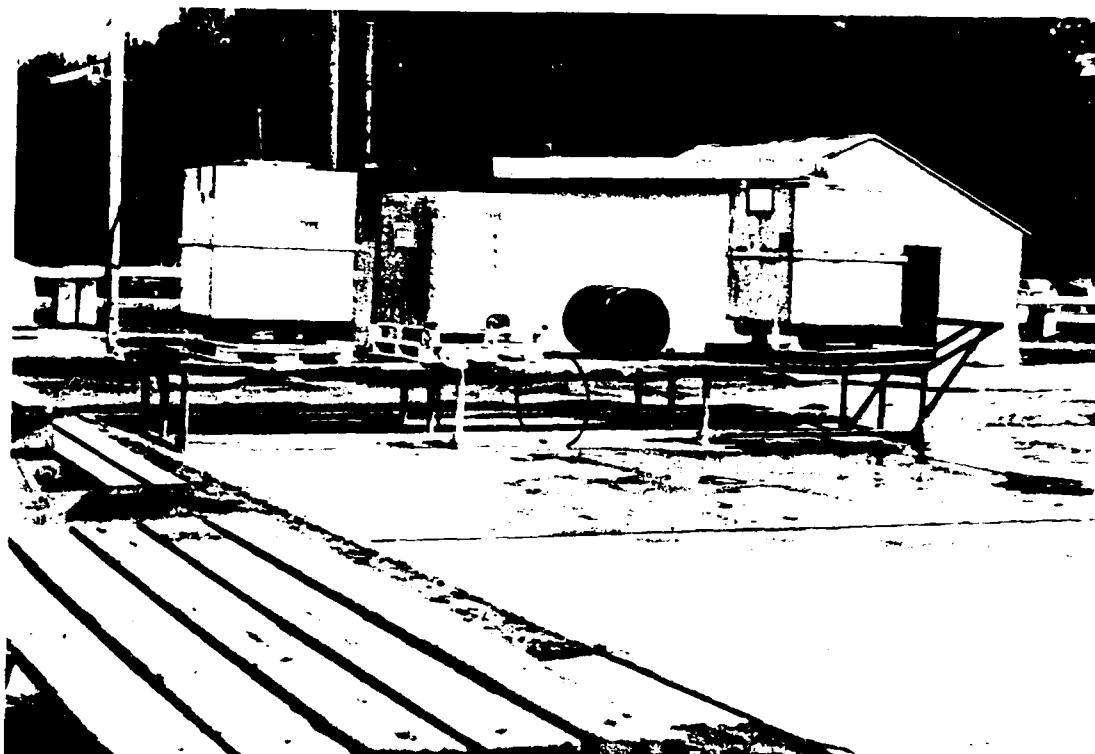


Figure 9. Soap Dispensers at the Aircraft Washrack

V. SUMMARY OF THE GENERAL WASTE DISPOSAL PRACTICES AT PAFB

The waste disposal practices for different categories of waste are summarized in this section.

1. Used oil, used fluids (i.e., transmission fluid, brake fluid and hydraulic fluid) and contaminated JP-4 jet fuel are burned in the Fort Bragg heating plant. The wastes pumped out of the 21 oil/water separators on base are also burned in the heating plant.
2. Most PD-680 is given to Fort Bragg to be burned in the heating plant. However, the PD-680 from the GTC Shop and the 317th Refueling Maintenance Shop is discharged down drains connected to oil/water separators leading to the sanitary sewer.
3. Approximately 400 lithium batteries/month (generated by four shops on base, the Combat Control School being the major generator) are turned in to base supply using a one-for-one turn-in system. DRMO picks up the batteries once a month and disposes of them as a reactive hazardous waste (D003).

4. All shops that use automotive fuel except for the 317th Fire Truck Maintenance Shop, give their used automotive fuel to Fort Bragg to be burned. The 317th Fire Truck Maintenance Shop uses all or at least most of the automotive fuel during their normal operations. Small amounts of unused automotive fuel is kept by the shop in a fuel tank and later reused.

5. Paint wastes and waste thinners are stored in 55-gallon drums and disposed of as hazardous waste.

6. Most stripping wastes are stored in 55-gallon drums and disposed of as hazardous waste, although some stripping wastes in the Wheel and Tire Shop are rinsed down the drain into the sewer system.

7. Battery acids are neutralized and poured down the drain.

8. The Power Production Shop stores used antifreeze in a 55-gallon drum and turns it over to Fort Bragg to be burned. Used antifreeze from other shops is poured down the drain leading to the sanitary sewer.

9. Waste photographic fixer is turned over to DRMO who reclaims the silver.

10. NDI waste (penetrant and emulsifier) is drummed and disposed of as hazardous waste.

11. Empty spray paint cans are thrown in the trash.

12. Speedy Dry, used to soak up spilled oil, is used until it is saturated and then thrown in the trash.

VI. OBSERVATIONS AND CONCLUSIONS

A. Pope AFB has a small hazardous waste program that is currently working fairly well. With some refinements, the base has an opportunity to have an excellent program.

B. Pope AFB has no current baseline chemical analyses (last one was done in 1982) to characterize wastestreams. The shops are responsible for identifying what goes into waste containers; however, without baseline wastestream analyses, untrained technicians may incorrectly characterize waste as either hazardous or nonhazardous wastes.

C. The Environmental Coordinator (DEEV) is responsible for training accumulation site managers, who, in turn train other shop personnel. There were two training courses (Dec 86, Apr 87, 6-8 hours each) taught by the time of this survey. The goal of DEEV is to teach three courses per year. The courses are derived from the Research Triangle training program developed specifically for TAC. This training, when fully developed, could prove to be beneficial.

D. DEEV is not involved with the specific day-to-day logistical details of waste disposal. The program is primarily managed at the shop level. The accumulation site managers are responsible for their own areas.

E. Washrack personnel have replaced PD-680 at the washrack with two different concentrations of Type I aircraft soap (NSN 6850-01-192-1776). The first is diluted 1:1 and is used on heavily soiled areas. The second is diluted 4-16:1 and is used to wash the rest of the aircraft. Personnel said they preferred PD-680 for heavily soiled areas because it cleaned oil and grease better than soap. However, they indicated the soap works well, except more scrubbing is required than if PD-680 was used.

F. The Engine Shop uses an average of one roll of absorbent padding (\$90-\$100/roll) per week to soak up oil spills and drippings. This generates a 55-gallon drum of waste absorbent padding per day, that is burned at the fire training pit. Other shops also use these absorbent pads for soaking up oil spills.

G. The Battery Shop places battery acid in a 40-gallon container and neutralizes it with sodium bicarbonate to pH of 7 before draining it to the sewer. The neutralized battery acid has never been tested for heavy metals.

H. Refueling Maintenance has an accumulation site located next to the shop (Bldg 150, see Figure 10), however, it is not being used. Any wastes generated in the shop are disposed of by pouring the waste down the floor drain, through the fuel/water separator leading to the sanitary sewer.

I. Most accumulation sites (e.g., Corrosion Control Accumulation Site, see Figure 7) were secured but not covered or diked.

J. The Engine shops accumulation site is not secured, or covered and is located near a storm sewer. Since this area is not diked or curbed, spills have the potential of contaminating large areas because spilled wastes (oil, PD-680, hydraulic fluid) can enter the drainage system and discharge at either the sewage treatment plant or the local creeks.

K. AGE Pickup and Delivery turns their empty spray cans in to base supply as scrap metal. This unique disposal practice is more cost-effective than throwing them in the trash, as long as there is a vendor to accept them.

L. The Wheel and Tire Shop have replaced PD-680 in their 165-gallon cold degreasing tank with Citrikleen. Citrikleen is diluted 3:1 with water. Shop personnel prefer Citrikleen over PD-680 because it is less irritating to the skin and it does an equivalent or better job degreasing parts than PD-680.

M. The base is currently disposing lithium batteries at a cost of about \$9.00 per pound. The annual cost to the base is approximately \$40-\$60,000 per year. At the current time there is no other way to dispose of spent lithium batteries. According to Power Conversion, the manufacturers are working on producing rechargeable lithium batteries but are still a long way from marketing them.²



Figure 10. Refueling Maintenance Accumulation Site

N. The TRANS section has converted their PD-680 degreasing units to Safety Kleen units. Safety Kleen Corporation services these degreasing units, i.e., drains the used degreasant and replenishes the units on a routine schedule. This service relieves base of purchasing and disposal responsibilities for the degreasant (normally PD-680).

O. The Bioenvironmental Engineering Shop and Civil Engineering have put together an asbestos removal team. Personnel from Civil Engineering have the responsibility of removing the asbestos and personnel from the Bioenvironmental Engineering shop are responsible for all environmental monitoring. The State of North Carolina is called whenever the team is about to remove asbestos from a building. A state representative comes out to the site to assure that all environmental regulations are met. To date, the asbestos removal team has been working very smoothly and saving the base the cost of using a contractor on asbestos removal. Asbestos waste is bagged, labeled, and transported to Fort Bragg's landfill.

P. All petroleum products whose total chlorinated hydrocarbon concentration are under 1000 ppm, (i.e., waste oils, waste fluids, waste JP-4, etc.) are taken to Fort Bragg's heating plant and burned for energy recovery. The plant meets all RCRA standards and has a permit to burn these chemicals. Last year the plant burned approximately 300,000 gallons of waste oil from both Fort Bragg and Pope AFB.

Q. TRANS General Purpose Maintenance Shop personnel have installed an oil collection system (Figure 11) that allows shop personnel to pour oil into a container from inside the building. The container is directly connected to a 100-gallon underground tank located outside of the building.

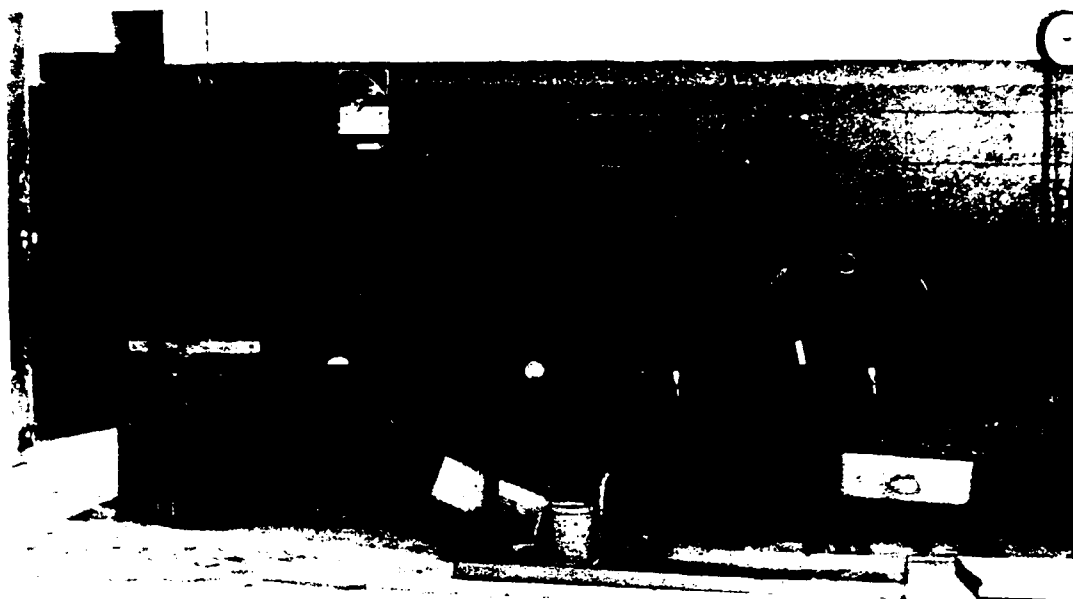


Figure 11. TRANS General Purpose Vehicle Oil Collection System

R. TRANS Allied Trades Shop has a waterfall paint booth. When the system is cleaned, the sludge is skimmed off and the water is drained. The waste sludge is placed in 55-gallon drums and disposed of as hazardous waste.

S. The base uses a large quantity of PD-680 for degreasing operations. In general, waste PD-680 is placed in 55-gallon drums and disposed of by burning in Fort Bragg's heating plant.

VII. RECOMMENDATIONS

A. Pope AFB needs to update their waste analysis plan. This plan should include: a complete listing of all known wastestreams with a brief description of the process or operation generating the waste; the results of a baseline chemical analysis (to fully characterize the waste); the required analysis frequency; the sampling technique; and the parameters of analysis (see Table 3), in addition to the information already provided in the base's Hazardous Waste Management Plan. Since the base does not have a large number of wastestreams, this type of sampling program will allow the base to establish, within a reasonable time, documented rationale for classifying each wastestream as either hazardous or nonhazardous. For example, neutralized battery acid is disposed of as nonhazardous waste yet, it has not been adequately analyzed for heavy metals to substantiate whether or not it is nonhazardous.

B. All waste storage sites should be secured to prevent or discourage any intentional or unintentional mixing of wastes. Funding should be made available to upgrade each accumulation site with fencing, an impermeable floor (such as a concrete pad) with curbing and a cover.

C. The base should do characteristic hazardous waste (EP Toxicity³) analysis on neutralized battery acid. Presently, all neutralized battery acid is disposed of down the drain. Base personnel should proceed with routine analyses to document whether all or some of the neutralized acid may be disposed of in this manner.

D. The base should start a program to test the integrity of its underground tanks. At a minimum, some kind of inventory control system should be implemented to detect any gross leakage.

E. The wastewater from the waterfall paint booths at the Allied Trades Paint Shop and the Corrosion Control Shop should be routinely tested for characteristic hazardous waste prior to cleanout to confirm that it is not hazardous before discharging this waste to the sewer system.

F. The Engine Shop should acquire or build metal or plastic pans to catch oil dripping from the engines. This would greatly reduce the amount of absorbent padding they are currently using (1 roll/wk, at about \$90-\$100/roll) to absorb oil spills. Oil caught in the pans could then be placed in either drums or bowlers and taken to the Fort Bragg heating plant for energy recovery. Also, a basewide survey is necessary to determine how much the base is spending on adsorbent pads to catch small oil dripping.

G. The Valvoline degreaser in the Auto Hobby Shop's degreasing tank should be drummed, sampled and analyzed to determine its composition before shop personnel drain it to the oil/water separator. If it is a characteristic hazardous waste, it should be disposed of as hazardous waste. However, if the spent degreaser is an ignitable hazardous waste, the feasibility of burning it in the Fort Bragg Heating Plant should be investigated.

H. The Refueling Maintenance personnel can reduce the amount of JP-4 entering the fuel/water separator by purchasing or acquiring metal pans to catch JP-4 from the fuel systems they are working on. The JP-4 can then be tested to see if it meets specifications. If so, it might be returned to the base JP-4 tanks for reuse. In addition, waste oils and waste fluids should be placed in drums at their accumulation site and tested to see if they can be burned at the Fort Bragg heating plant instead of being drained into the floor drains.

I. The base uses PD-680 in fairly large quantities for parts degreasing. PD-680 usage can be further minimized by using Safety Kleen units.

J. The Safety Kleen Corporation has recently marketed a unit to clean painting equipment such as spray guns. Such a unit might be used in the Corrosion Control Shop, and the Allied Trades Shop to reduce the amount of paint wastes generated from these shops.

TABLE 3. EXAMPLE OF WASTE ANALYSIS PLAN

SHOP (BUILDING)	DESCRIPTION OF WASTE STREAM	BASELINE ANALYSIS (DATE)	EPA NO.	ANALYSIS FREQUENCY	SAMPLING TECHNIQUE	PARAMETERS
317 Allied Trades (454)	PAINT SLUDGE FROM PAINT BOOTH	(DEC 84) FP-H (70 F) PH-NH, EP-NH RX-NH	D001	SEMIANNUALLY (EACH DRUM)	GRAB OF PAINT SLUDGE	FLASH POINT
TRANS/BATTERY SHOP (454)	NEUTRALIZED BATTERY ACID	(JAN 86) FP-NH, EP-NH PH-NH, RX-NH	NH	ANNUAL SPOT CHECK (EVERY OTHER DRUM)	COILWASA	LEAD, CADMIUM
317 Allied Trades (454)	RINSEWATER FROM WATERFALL PAINTBOOTH	(JUN 85) FP-H (120 F) PH-NH (6.5) RX-NH, EP-H (CHROMIUM, CADMIUM)	D001 D007	QUARTERLY CLEANOUT	DIPPER	FLASH POINT, PH CHROMIUM, CADMIUM

LEGEND: FP - IGNITABILITY; PH - CORROSIVITY; RX - REACTIVITY; EP - EP TOXICITY;
 H - HAZARDOUS; NH - NONHAZARDOUS

K. The Corrosion Control Shop and the Aircraft Refurbishing Shop use approximately 15-20 gallons of MEK/1-2 weeks. It may be economically feasible to procure a small 5-10 gallon still and recycle the MEK. The recycled MEK can be used for cleaning painting equipment.

L. Saturated Speedy Dry should be disposed of as hazardous waste rather than thrown in the dumpster.

M. The unidentifiable drums of waste stored in the hazardous material holding facility (Bldg 41115) need to be sampled prior to disposal.

N. In education and training, the BEE Shop should be providing inputs on the health hazards associated with hazardous waste management because many shop personnel are physically involved with the handling and transporting of hazardous wastes. Furthermore, the environmental coordinator should make sure shop personnel are aware of the capabilities and the limitations of oil/water separators with respect to chemical waste disposal.

O. The USEPA uniform manifest is signed by the environmental coordinator. When the environmental coordinator is unavailable, the manifest should be signed by an authorized person in civil engineering with concurrence by the BEE rather than having the BEE sign the manifest. This will maintain consistent organizational control and responsibility of the manifests.

References

1. Pope Air Force Base, "Hazardous Waste Management (HMW) Plan," December 1982.
2. Phone Com with Marie Freedman, Sales Representative, Power Conversion 12 Aug 87.
3. United States Environmental Protection Agency "Identification and Listing of Hazardous Waste," 40 CFR 261.

APPENDIX A
Request Letter

(This page left blank)



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 317TH TACTICAL AIRLIFT WING (MAC)
NOPE AIR FORCE BASE, NORTH CAROLINA 28308

DM

ECW

REPLY TO
ATTN OF: SGPB

27 March 1987

SUBJECT: Request for Hazardous Waste Assistance Survey

TO HQ MAC/SGPB *ECW*
USAF OEHL/EC
IN TURN

1. Please schedule us for a Hazardous Waste Assistance Survey. The new environmental coordinator and I would like you to evaluate our management practices and help us explore hazardous waste minimization opportunities.
2. We'll forward a copy of our Hazardous Waste Management Plan to help you prepare for this visit. We're not locked into any specific time frame for this survey.
3. Thanks for the support. Contact me at Autovon 486-4873 if you have any questions about our request.

Paul B. Devane
PAUL B. DEVANE, 2LC, USAF, BSC
Chief, Bioenvironmental Engineering

cc: 317 CSG/DEEV

000100

6155-1

10-00

(This page left blank)

APPENDIX B

Waste Disposal Practices by Shop

(This page left blank)

DISPOSAL PRACTICES BY SHOP FOR POPE AFB

Type of Shop: 317th Refueling Maint

Building Number: 150

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
10W-40 Oil	120.000	RDD
Soaps	48.000	RDD
Transmission Fluid	6.000	RDD
PD-680	12.000	RDD
JP-4	360.000	RDD
TOTAL:	546	

Type of Shop: Fire Truck Maint

Building Number: 250

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Hydraulic Fluid	12.000	KIT
Soaps	150.000	RDD
Transmission Fluid	60.000	KIT
Antifreeze	50.000	RDD
Engine Oils	60.000	KIT
Automotive Fuels	48.000	KIT
Brake Fluid	24.000	RDD
TOTAL:	404	

Type of Shop: Auto Hobby Shop

Building Number: 390

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Valvoline Degreaser	660.000	KIT
Transmission Fluid	240.000	KIT
Engine Oil	1800.000	KIT
Aircraft Cleaning	660.000	RDD
TOTAL:	3360	

DISPOSAL PRACTICES BY SHOP FOR POPE AFB

Type of Shop: GP Vehicle Maint

Building Number: 454

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Transmission Fluid	12.000	DD
Aircraft Soap	600.000	RDD
TOTAL:	612	

Type of Shop: Intermediate Maint

Building Number: 454

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Transmission Fluid	12.000	PIT
Motor Oil	2100.000	PIT
TOTAL:	2112	

Type of Shop: Special Veh. Maint

Building Number: 454

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Aircraft Soap	660.000	RDD
Brake Fluid	3.000	D
Automotive Fuel	60.000	RTT
Transmission Fluid	15.000	D
Hydraulic Fluid	60.000	D
TOTAL:	798	

Type of Shop: TRANS Allied Trades

Building Number: 454

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Paint Waste	330.000	D
TOTAL:	330	

DISPOSAL PRACTICES BY SHOP FOR POPE AFB

Type of Shop: Power Production

Building Number: 625

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Soaps	220.000	RDD
Motor Oil	200.000	D
Antifreeze	24.000	D
Battery Acid	36.000	NDD
TOTAL:	480	

Type of Shop: Repair and Reclamation

Building Number: 712

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Hydraulic Fluid	2.000	B
TOTAL	2	

Type of Shop: Wheel and Tire Shop

Building Number: 712

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Citrikleen	330.000	DD
PD-680	120.000	D
Stripping Waste	660.000	D
TOTAL:	1110	

Type of Shop: GTC

Building Number: 715

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Hydraulic Fluid	48.000	D
PD-680	120.000	RDD
TOTAL:	168	

DISPOSAL PRACTICES BY SHOP FOR POPE AFB

Type of Shop: JEIM

Building Number: 715

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Engine Oil	288.000	D
PD-680	120.000	D
Citrikleen HD	240.000	DD
JP-4	24.000	D
TOTAL:	672	

Type of Shop: KITS

Building Number: 715

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
PD-680	120.000	DD
Carbon Remover	16.000	D
TOTAL:	136	

Type of Shop: Prop Shop

Building Number: 715

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Hydraulic Fluid	1440.000	D
TOTAL:	1440	

Type of Shop: 317 Phase

Building Number: 722

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Aircraft Engine Oil	1200.000	B
Hydraulic Fluid	120.000	D
TOTAL:	1320	

DISPOSAL PRACTICES BY SHOP FOR POPE AFB

Type of Shop: 317 AGE

Building Number: 723

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
PD-680	480.000	D
Hydraulic Fluid	30.000	D
PD-680	640.000	RDD
B&B 2023A	660.000	RDD
Antifreeze	96.000	RDD
Motor Oil	350.000	B
TOTAL:	2256	

Type of Shop: 317th Corrosion Control

Building Number: 731

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Stripping Waste	330.000	D
Paint Waste	1250.000	D
TOTAL:	1580	

Type of Shop: 317th Electric Shop

Building Number: 731

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Battery Acid	120.000	NDD
TOTAL:	120	

Type of Shop: 317th Pneudraulics

Building Number: 731

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
PD-680	330.000	D
TOTAL:	330	

DISPOSAL PRACTICES BY SHOP FOR POPE AFB

Type of Shop: NDI

Building Number: 731

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Kodak Developer	120.000	DD
Dye Penetrant	110.000	D
Emulsifier	110.000	D
Magnaglo Carrier	50.000	D
Kodak Fixer	30.000	SRDD
TOTAL:	420	

Type of Shop: Aircraft Refurbishing

Building Number: 732

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Paint Waste	600.000	D
TOTAL:	600	

Type of Shop: Fuel System Repair

Building Number: 734

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Compressor Oil	3.000	D
JP-4	7200.000	D
TOTAL:	7203	

Type of Shop: 317th AGE Pickup

Building Number: 759

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Hydraulic Fluid	12.000	T
Motor Oil	60.000	T
TOTAL:	72	

DISPOSAL PRACTICES BY SHOP FOR POPE AFB

Type of Shop: Aircraft Washrack

Building Number: 764

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
EZE Soap	2650.000	RDD
TOTAL:	2650	

Type of Shop: MAPS Vehicle Maint

Building Number: 766

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Soaps	240.000	RDD
Hydraulic Fluid	600.000	KIT
Transmission Fluid	144.000	KIT
Brake Fluid	24.000	KIT
Motor Oils	1800.000	KIT
PD-680	1320.000	RDD
Battery Acid	240.000	NDD
TOTAL:	4368	

Type of Shop: Test Cell

Building Number: 792

WASTE PRODUCT	QTY/GALLONS/YR	DISPOSAL
Hydraulic Fluid	360.000	D
Engine Oil	360.000	D
Penetone Super Load	180.000	RDD
TOTAL:	900	

LEGEND:

D - DRUMMED KIT - KEPT IN TANK B - BOWSER
 RDD - RINSED DOWN DRAIN RTT - RETURNED TO TANK T - TANK
 PIT - PLACED IN TANK NDD - NEUTRALIZED PLACED DOWN DRAIN
 SRDD - SILVER RECOVERY PROCESS AND THEN PLACED DOWN DRAIN

(This page left blank)

APPENDIX C
Waste Disposal Form

(This page left blank)

Shop:
 Shop Supervisor:
 Shop Duties:

Building Number:
 Autovon:

CATAGORIES OF WASTE AND DISPOSAL METHODS			
TYPE OF WASTE	DISPOSAL METHOD *(D,DD)	AMOUNT GENERATED (per month)	COMMENTS
1. PAINT WASTES			
2. WASTE THINNERS			
3. \$ STRIPPING WASTE			
4. \$ WASTE ACIDS			
5. WASTE BATTERY ACID			
6. \$ SOAPS			
7. \$ OILS			
8. TRANSMISSION FLUID			
9. BRAKE FLUID			
10. HYDRAULIC FLUID			
11. JET FUEL			
12. AUTOMOTIVE FUEL			
13. ANTIFREEZE			
14. \$ SOLVENTS			
15. \$ DEGREASANTS			
16. \$ PHOTO WASTES			
17. \$			

\$ specify the types used on next page
 * USED DISPOSAL CODES BELOW:

D-DRUMMED	RTT-RETURNED TO FUEL TANKS	UIP-USED IN PROCESS
DD-DOWN DRAIN	FTP-GOES TO FIRE TRAINING PIT	KIT-KEPT IN TANK
NDD-NEUTRALIZED FIRST THEN PLACED DOWN DRAIN		O-OTHER (specify)
RDD-RINSED OFF AND RINSEWATER GOES DOWN DRAIN		E-EVAPORATED
SRDD-SILVER RECOVERY UNIT THEN DOWN DRAIN		NA-NOT APPLICABLE

SPECIFIC CHEMICALS USED

STRIPPERS

Name of Stripper	Manufacturer	Amt/vk or		National Stock Number
		Tank Cap.	Change out/ Freq.	

SOLVENTS/DEGREASANTS

Name of Chemical	Manufacturer	Amt/vk or		National Stock Number
		Tank Cap.	Change out/ Freq.	

SOAPS

Name of Soap	Manufacturer	Amt used/vk	National Stock Number

OILS

Name of Oil	Amt used/week	Disposal Method

Chemical listing (cont.)

ACIDS

Name of Acid	Manufacturer	Amt used/wk	National Stock Number

PHOTO CHEMICALS

Name of Chemical	Manufacturer	Amt/wk or		National Stock Number
		Tank Cap.	Change out/ Freq.	

NDI CHEMICALS

Name of Chemical	Manufacturer	Amt/wk or		National Stock Number
		Tank Cap.	Change out/ Freq.	

Other Chemicals Not Listed

Name of Chemical	Manufacturer	Amt/wk or		National Stock Number
		Tank Cap.	Change out/ Freq.	

Shop supervisors signature: _____

(This page left blank)

APPENDIX D

Summary of Annual Forecasted Wastes Generated

(This page left blank)

ANNUAL FORECASTED WASTES
GENERATED AT POPE AFB

ACTIVITY	PRODUCT	QTY/GALLONS
317th Refueling Maint	10W-40 Oil	120.000
317th Phase	Aircraft Engine oil	1200.000
Fire Truck Maint	Automotive Fuel	48.000
Special Veh. Maint	Automotive Fuel	60.000
317th Electric Shop	Battery Acid	120.000
MAPS Vehicle Maint	Battery Acid	240.000
Power Production	Battery Acid	36.000
Fire Truck Maint	Brake Fluid	24.000
MAPS Vehicle Maint	Brake Fluid	24.000
Special Veh. Maint	Brake Fluid	3.000
KITS	Carbon Remover	16.000
Wheel and Tire Shop	Citrikleen	330.000
JEIM	Citrikleen HD	240.000
Fuel System Repair	Compressor Oil	3.000
NDI	Dye Penetrant	110.000
NDI	Emulsifier	110.000
Auto Hobby Shop	Engine Oil	1800.000
Test Cell	Engine Oil	360.000
JEIM	Engine Oil	288.000
Fire Truck Maint	Engine Oil	60.000
Test Cell	Hydraulic Fluid	360.000
Special Veh. Maint	Hydraulic Fluid	60.000
Prop Shop	Hydraulic Fluid	1440.000
Fire Truck Maint	Hydraulic Fluid	12.000
Repair and Reclamation	Hydraulic Fluid	2.000
MAPS Vehicle Maint	Hydraulic Fluid	600.000
317th Phase	Hydraulic Fluid	120.000
GTC	Hydraulic Fluid	48.000
317th AGE Pickup	Hydraulic Fluid	12.000
317th AGE	Hydraulic Fluid	30.000
JEIM	JP-4	24.000
Fuel System Repair	JP-4	7200.000
317th Refueling Maint	JP-4	360.000
NDI	Kodak Developer	120.000
NDI	Kodak Fixer	30.000
NDI	Magnaglo Carrier	50.000
Power Production	Motor Oil	200.000
317th AGE	Motor Oil	350.000
Intermediate Maint	Motor Oil	2100.000
317th AGE Pickup	Motor Oil	60.000
MAPS Vehicle Maint	Motor Oils	1800.000
KITS	PD-680	120.000
JEIM	PD-680	120.000
GTC	PD-680	120.000

ANNUAL FORECASTED WASTES
GENERATED AT POPE AFB

ACTIVITY	PRODUCT	QTY/GALLONS
317th Refueling Maint	PD-680	12.000
317th AGE	PD-680	480.000
317th Pneudraulics	PD-680	330.000
MAPS Vehicle Maint	PD-680	1320.000
317th AGE	PD-680	640.000
Wheel and Tire Shop	PD-680	120.000
Aircraft Refurbishing	Paint Waste	600.000
317th Corrosion Control	Paint Waste	1250.000
TRANS Allied Trades	Paint Waste	330.000
317th Corrosion Control	Stripping Waste	330.000
Wheel and Tire Shop	Stripping Waste	660.000
Intermediate Maint	Transmission Fluid	12.000
Special Veh. Maint	Transmission Fluid	15.000
317th Refueling Maint	Transmission Fluid	6.000
MAPS Vehicle Maint	Transmission Fluid	144.000
GP Vehicle Maint	Transmission Fluid	12.000
Fire Truck Maint	Transmission Fluid	60.000
Auto Hobby Shop	Transmission Fluid	240.000
Auto Hobby Shop	Valvoline Degreaser	660.000
	TOTAL	27751.000

ANNUAL FORECASTED WASTES
GENERATED AT POPE AFB

Type of Waste: WASTE OILS

SHOP	BLDG	PRODUCT	QTY/GALLONS
317th Phase	722	Aircraft Engine Oil	1200.000
Auto Hobby Shop	390	Engine Oil	1800.000
317th AGE Pickup	759	Motor Oil	60.000
MAPS Vehicle Maint	766	Motor Oils	1800.000
Fuel System Repair	734	Compressor Oil	3.000
317th Refueling Maint	150	10W-40 Oil	120.000
Power Production	625	Motor Oil	200.000
Fire Truck Maint	250	Engine Oils	60.000
317th AGE	723	Motor Oil	350.000
Test Cell	792	Engine Oil	360.000
JEIM	715	Engine Oil	288.000
Intermediate Maint	454	Motor Oil	2100.000
TOTAL			8341

Type of Waste: JET FUEL

SHOP	BLDG	PRODUCT	QTY/GALLONS
JEIM	715	JP-4	24.000
317th Refueling Maint	150	JP-4	360.000
Fuel System Repair	734	JP-4	7200.000
TOTAL			7584

ANNUAL FORECASTED WASTES
GENERATED AT POPE AFB

Type of Waste: HYDRAULIC FLUID

SHOP	BLDG	PRODUCT	QTY/GALLONS
317th AGE Pickup	759	Hydraulic Fluid	12.000
Auto Hobby Shop	390	Transmission Fluid	240.000
Fire Truck Maint	250	Transmission Fluid	60.000
GTC	715	Hydraulic Fluid	48.000
MAPS Vehicle Maint	766	Transmission Fluid	144.000
Test Cell	792	Hydraulic Fluid	360.000
MAPS Vehicle Maint	766	Brake Fluid	24.000
Fire Truck Maint	250	Brake Fluid	24.000
Fire Truck Maint	250	Hydraulic Fluid	12.000
Special Veh. Maint	454	Transmission Fluid	15.000
317th Phase	722	Hydraulic Fluid	120.000
317th Refueling Maint	150	Transmission Fluid	6.000
Special Veh. Maint	454	Hydraulic Fluid	60.000
Prop Shop	715	Hydraulic Fluid	1440.000
Special Veh. Maint	454	Brake Fluid	3.000
Repair and Reclamation	712	Hydraulic Fluid	2.000
Intermediate Maint	454	Transmission Fluid	12.000
GP Vehicle Maint	454	Transmission Fluid	12.000
317th AGE	723	Hydraulic Fluid	30.000
MAPS Vehicle Maint	766	Hydraulic Fluid	600.000
TOTAL:			3224

Type of Waste: PD-680 USED FOR WASHING EQUIPMENT

SHOP	BLDG	PRODUCT	QTY/GALLONS
317th Refueling Maint	150	PD-680	12.000
KITS	715	PD-680	120.000
317th AGE	723	PD-680	640.000
MAPS Vehicle Maint	766	PD-680	1320.000
GTC	715	PD-680	120.00
TOTAL:			2212

ANNUAL FORECASTED WASTES
GENERATED AT POPE AFB

Type of Waste: PAINT WASTES

SHOP	BLDG	PRODUCT	QTY/GALLONS
Aircraft Refurbishing	732	Paint Waste	600.000
317th Corrosion Control	731	Paint Waste	1250.000
TRANS Allied Trades	454	Paint Waste	120.000
TOTAL:			2180

Type of Waste: SOLVENTS OTHER THAN PD-680

SHOP	BLDG	PRODUCT	QTY/GALLONS
KITS	715	Carbon Remover	16.000
Auto Hobby Shop	390	Valvoline Degreaser	660.000
JEIM	715	Citrikleen HD	240.000
Wheel and Tire Shop	712	Citrikleen	330.000
TOTAL:			1246

Type of Waste: PD-680 USED FOR PARTS DEGREASING

SHOP	BLDG	PRODUCT	QTY/GALLONS
Wheel and Tire Shop	712	PD-680	120.000
317th AGE	723	PD-680	480.000
JEIM	715	PD-680	120.000
317th Pseudraulics	731	PD-680	330.000
TOTAL:			1050

Type of Waste: STRIPPING WASTE

SHOP	BLDG	PRODUCT	QTY/GALLONS
317th Corrosion Control	731	Stripping Waste	330.000
Wheel and Tire Shop	712	Stripping Waste	660.000
TOTAL			990

ANNUAL FORECASTED WASTES
GENERATED AT POPE AFB

Type of Waste: NDI CHEMICALS

SHOP	BLDG	PRODUCT	QTY/GALLONS
NDI	731	Kodak Developer	120.000
NDI	731	Kodak Fixer	30.000
NDI	731	Emulsifier	110.000
NDI	731	Magnaglo Carrier	50.000
NDI	731	Dye Penetrant	110.000
TOTAL:			420

ANNUAL FORECASTED WASTES
GENERATED AT POPE AFB

Type of Waste: WASTE BATTERY ACID

SHOP	BLDG	PRODUCT	QTY/GALLONS
MAPS Vehicle Maint	766	Battery Acid	240.000
Power Production	625	Battery Acid	36.000
317th Electric Shop	731	Battery Acid	120.000
TOTAL:			396

Type of Waste: AUTOMOTIVE FUEL

SHOP	BLDG	PRODUCT	QTY/GALLONS
Fire Truck Maint	250	Automotive Fuel	48.000
Special Veh. Maint	454	Automotive Fuel	60.000
TOTAL			108

Distribution List

	Copies
HQ AFSC/SGPB Andrews AFB DC 20334-500	1
HQ USAF/SGPA Bolling AFB DC 20332-6188	1
HQ MAC/DE Scott AFB IL 62221-5001	2
HQ MAC/SGPB Scott AFB IL 62221-5001	2
AAMRL/TH Wright-Patterson AFB OH 45433-6573	1
USAF Regional Medical Center Wiesbaden/SGPB APO New York 09220-5300	1
OL AD, USAFOEHL APO San Francisco 96274-5000	1
USAFSAM/TSK Brooks AFB TX 78235-5301	1
USAFSAM/EDH Brooks AFB TX 78235-5301	1
Defense Technical Information Center (DTIC) Cameron Station Alexandria VA 22319	2
HQ USAF/LEEV Bolling AFB DC 20330-5000	2
HQ AFESC/RDV Tyndall AFB FL 32403-6001	1
USAF Clinic Pope/SGPB Pope AFB NC 28308-5300	3
317 ABG/DEEV Pope AFB NC 28308-5000	3

END

DATE

FILMED

DTIC

July 88